

Influence of Ceramic Shell Thickness and Pouring Temperature on Shrinkage Porosity during Investment Casting of Turbine Blades

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ABSTRACT

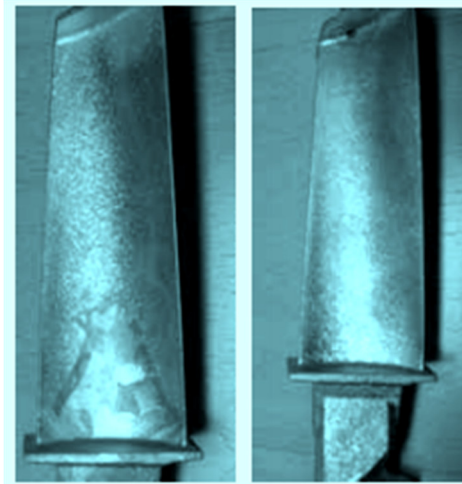


Figure 1: Shrinkage porosity in turbine blades.

Turbine blades have complex geometries. Blades have different thickness at the trailing and leading edges as well as sharp bends at the chord-tip shroud junction and sharp fins at the tip shroud. The general problem in investment casting of blades is the shrinkage at the tip-shroud and cord junction. The objective of this project work is to evaluate the influence of ceramic shell thickness and pouring temperature on shrinkage porosity. The main conclusions drawn from the present work are:

- An increase in the shell thickness has increased the feeding distance. This could prevent interdendritic shrinkage.

Shrinkage porosity was reduced due to slower cooling rate on account of steeper thermal gradient at metal mold interface induced by the thicker ceramic shell. This could also enhance fluidity in thinner sections.

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